

Name: _____ Date: _____

Algebra 1B Unit 2 Practice Test

1. Please answer each question in at least TWO COMPLETE SENTENCES using at least TWO ALGEBRAIC TERMS. Echo the prompt and avoid vague words.

a) What is a system of linear equations? When finding the solution of a system of linear equations, what are you searching for?

two or more equations that can/are graphed on one coordinate plane

You are searching for a point of intersection

b) What are the three possible solutions to a system of linear equations? Be sure to mention the solutions and the circumstances by which they occur.

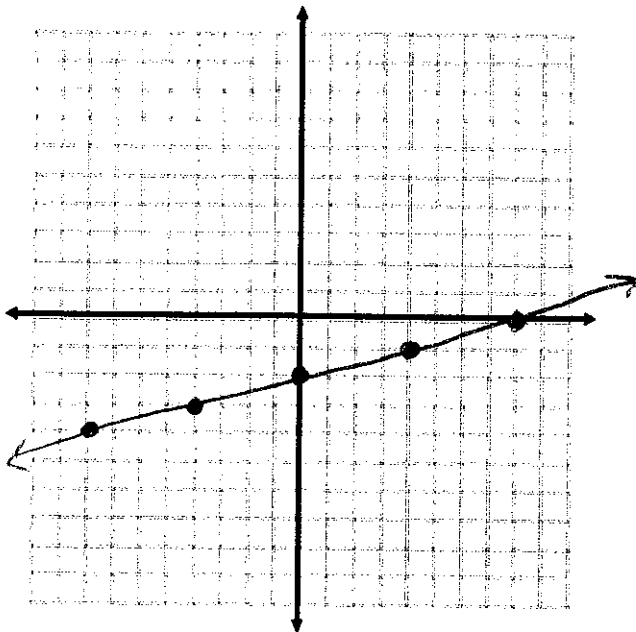
coordinate, no solution, infinitely many solutions

c) Write a system of linear equations. Tell which method you would use to solve this system and why.

2. Solve each system of equations by graphing.

You MUST check your solutions via SUBSTITUTION.

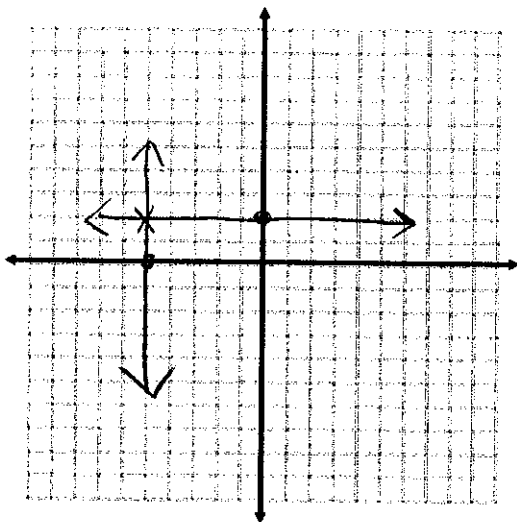
a) $y = \frac{1}{4}x - 2$ and $2x - 8y = 16$



infinitely many
solutions - they
are the same
line

Answer: (____, ____)

b) $x = -5$ and $y = 2$



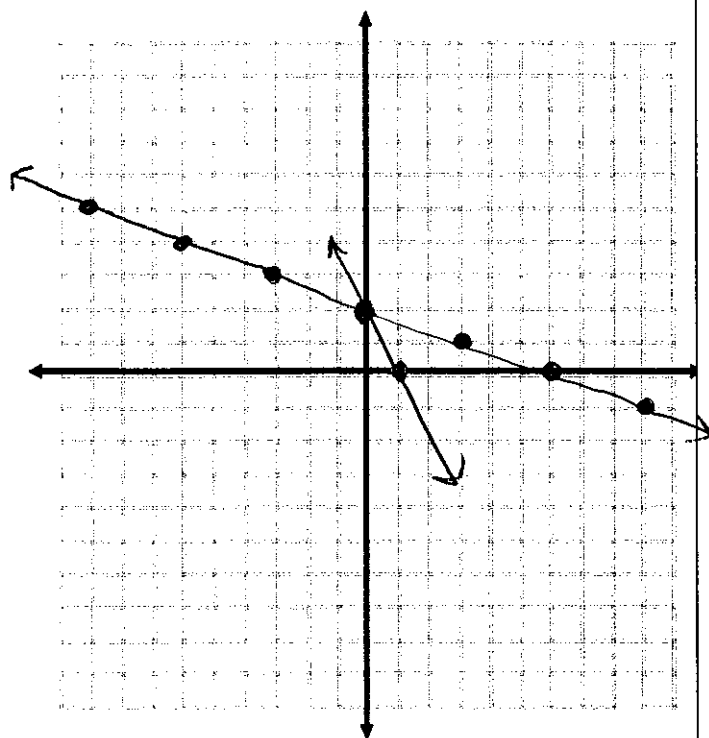
check:

$$-5 = -5 \checkmark$$

$$2 = 2 \checkmark$$

Answer: (-5, 2)

c) $y = -\frac{1}{3}x + 2$ and $2x + y = 2$



Check:

$$2 = -\frac{1}{3}(0) + 2$$

$$2 = 2 \checkmark$$

$$2(0) + 2 = 2$$

$$0 + 2 = 2$$

$$2 = 2 \checkmark$$

Answer: (0, 2)

3. Solve each system via substitution.

You MUST check your solutions via SUBSTITUTION.

a) $y = 4x + 3$ and $y = -x$

$$x = \frac{y}{4} + \frac{3}{4}$$

$$-4x - \frac{y}{4} = \frac{3}{4}$$

$$-3x = 3$$

$$\frac{-3}{-3} = \frac{3}{-3}$$

$$x = -1$$

$$y = 4(-1) + 3$$

$$y = -4 + 3$$

$$y = -1$$

$$-1 = -1 \checkmark$$

$$-1 = 4(-1) + 3$$

$$-1 = -4 + 3$$

$$-1 = -1 \checkmark$$

Answer: (-1, -1)

Isolate

Substitute

Solve

Substitute

Solve

Check

b) $y = \frac{1}{2}x + 14$ and $2x - 2y = -36$

$$2x - 2\left(\frac{1}{2}x + 14\right) = -36$$

$$2x - 1x - 28 = -36$$

$$x - 28 = -36$$

$$+28 \quad +28$$

$$\boxed{x = -8}$$

$$y = \frac{1}{2}(-8) + 14$$

$$y = -4 + 14$$

$$\boxed{y = 10}$$

Check

$$10 = \frac{1}{2}(-8) + 14$$

$$10 = -4 + 14$$

$$10 = 10 \checkmark$$

$$2(-8) - 2(10) = -36$$

$$-16 - 20 = -36$$

$$-36 = -36 \checkmark$$

Answer: $(-8, 10)$

4. Solve each system via elimination.

You MUST check your solutions via SUBSTITUTION.

a) $a + 2b = 19$

$$+ a - 2b = 11$$

$$2a = 30$$

$$\boxed{a = 15}$$

$$15 + 2b = 19$$

$$-15 \quad -15$$

$$2b = 4$$

$$\frac{2b}{2} = \frac{4}{2}$$

$$\boxed{b = 2}$$

Check:

$$15 + 2(2) = 19$$

$$15 + 4 = 19$$

$$19 = 19 \checkmark$$

$$15 - 2(2) = 11$$

$$15 - 4 = 11$$

$$11 = 11 \checkmark$$

Answer: $(15, 2)$

Multiply
eliminate
add
solve
Substitute
solve
check

$$\begin{array}{r} \text{b) } 3(4x + 2y = 10) \quad 12x + 6y = 30 \\ -2(3x + 3y = 9) \quad -6x - 6y = -18 \\ \hline \end{array}$$

$$6x = 12$$

$$\boxed{x = 2}$$

$$4(2) + 2y = 10$$

$$\begin{array}{r} 8 + 2y = 10 \\ -8 \quad -8 \\ \hline \end{array}$$

$$\frac{2y}{2} = \frac{2}{2}$$

$$\boxed{y = 1}$$

check

$$3(2) + 3(1) = 9$$

$$6 + 3 = 9$$

$$9 = 9 \checkmark$$

Answer: (2, 1)

KEEP GOING, WORD PROBLEMS ARE NEXT!

5. Ms. Chall wants a magician for the dance. She found two magicians in the area. Abraca charges a fifty dollar flat fee plus ten dollars per hour. Daba charges a ten dollar fee and thirty dollars per hour. After how many hours will the costs of the magicians be the same? What will that cost be?

a. Define variables that make sense for the situation.

Let C = total cost Let h = # hours

b. Write a system of equations.

$$C = 10h + 50$$

$$C = 30h + 10$$

c. Solve the system using a method of your choice.

$$\begin{array}{r} 10h + 50 = 30h + 10 \\ -10h \qquad -10h \\ \hline \end{array}$$

$$\begin{array}{r} 50 = 20h + 10 \\ -10 \qquad -10 \\ \hline \end{array}$$

$$\begin{array}{r} 40 = 20h \\ 20 \quad 20 \\ \hline \end{array}$$

$$\boxed{2 = h}$$

$$C = 10(2) + 50$$

$$C = 20 + 50$$

$$\boxed{C = 70}$$

d. Check via substitution and reality.

$$70 = 30(2) + 10$$

$$70 = 60 + 10$$

$$70 = 70 \checkmark$$

e. Write your answers with labels.

At two hours, both magicians will cost \$70.

6. A certain amusement park has an entrance fee and an additional fee for each game you choose to play. Miguel paid for himself and four of his friends to enter the park and paid for eighteen games, for a total of \$88.50. Dante paid for himself and two of his friends to enter the park and paid for twenty-two games, for a total of \$75.50. What is the cost of one entrance fee? one game?

a. Define variables that make sense for the situation.

Let f = # of entrance fees let g = # of games

b. Write a system of equations.

$$88.50 = 5f + 18g$$

$$75.50 = 3f + 22g$$

c. Solve the system using a method of your choice.

$$\begin{array}{rcl} 3(5f + 18g = 88.50) & \left\{ \begin{array}{l} \cancel{15f} + 54g = 265.50 \\ -5(3f + 22g = 75.50) \end{array} \right. & \left\{ \begin{array}{l} \cancel{-15f} - 110g = -377.50 \\ \hline -56g = -112 \\ \hline g = 2 \end{array} \right. \end{array}$$

$$5f + 18(2) = 88.50$$

$$\begin{array}{r} 5f + 36 = 88.50 \\ -36 \quad -36 \\ \hline 5f = 52.50 \end{array}$$

$$\frac{5f}{5} = \frac{52.50}{5}$$

$$f = 10.50$$

d. Check via substitution and reality.

$$3(10.50) + 22(2) = 75.50$$

$$31.50 + 44 = 75.50$$

$$75.50 = 75.50 \checkmark$$

e. Write your answers with labels.

One entrance fee costs \$10.50 and one game is \$2.

7. WLPCS received a grant to take a trip to California! They have a budget to take seven total modes of transportation, some planes and some buses. Each plane can hold one hundred forty passengers and each bus can hold sixty-four passengers. If there are a total of seven hundred fifty-two passengers, how many planes will WLPCS charter? How many buses?

a. Define variables that make sense for the situation.

Let $b = \#$ of buses let $p = \#$ of planes

b. Write a system of equations.

$$\begin{aligned} b + p &= 7 \\ 64b + 140p &= 752 \end{aligned}$$

c. Solve the system using a method of your choice.

$$\begin{aligned} b &= 7 - p \\ 64(7 - p) + 140p &= 752 \\ 448 - 64p + 140p &= 752 \\ 448 + 76p &= 752 \\ -448 & \quad -448 \\ 76p &= 304 \\ p &= 4 \end{aligned}$$

$$\begin{aligned} b + p &= 7 \\ -b &= -7 \\ \hline p &= 3 \end{aligned}$$

d. Check via substitution and reality.

$$\begin{aligned} 64(3) + 140(4) &= 752 \\ 192 + 560 &= 752 \\ 752 &= 752 \checkmark \end{aligned}$$

e. Write your answers with labels.

WLPCS will need 4 planes and 3 buses.

Multiple Choice: Write the CAPITAL LETTER of the correct answer.

8. C Which of the following systems does NOT have the solution (0, 3)?

~~X~~ $y = 3; x = 0$

~~X~~ $y = -2x + 3; 4x - 3y = -9$

C $y = 2x + 3; 4x + 3y = -9$

~~X~~ $y = -2/3x + 3; y = 7x + 3$

9. D Which of the following systems has NO solution?

~~X~~ $y = 3; x = 0$

~~X~~ $y = -2x + 3; y = 2x - 7$

~~X~~ $y = 1/2x; x + 2y = 6$

D $y = 1/2x - 9; x - 2y = 12$ ← same slope $-\frac{A}{B}$

10. B What is the first step to solving the system below by *elimination*?

$$4x - 2y = 13$$

$$5x - 2y = -9$$

A. add the two equations

B. multiply the second equation by negative one

C. multiply the second equation by negative two

D. isolate y in the first equation

11. D What is the first step to solving the system below by *substitution*?

$$y + 2x = -3$$

$$3x + 2y = 9$$

A. add the two equations

B. multiply the second equation by negative one

C. multiply the second equation by negative two

D. isolate y in the first equation

12. A Which of the following IS a system of linear equations?

A. $y = 2; x = 5$

~~B~~ $y = x^2 - 3; y = x + 5$

~~X~~ $y = 4x - 1$

~~D~~ $y = -5/3x + 1; y = x^3 - 2$

Open-Ended: Create an example for each situation described.

13. Write a system of equations that can be solved via elimination WITHOUT requiring multiplication as the first step.

same coefficient, dif signs

14. Write a system of linear equations with one equation in slope-intercept form and one equation in standard form.

$$y = 2x + 3$$

$$2x - 8y = 16$$

15. Write an equation that requires the use of the distributive property.

$$y = 2(y - 3) + 8$$

16. Write a system of linear equations that has infinitely many solutions.

$$y = 2x + 3$$

$$4x - 2y = 8$$